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Specifications

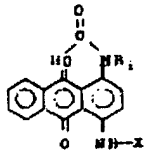
1. Name of the experiment

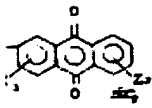
Electric toner used for static charge photo finishing

2. Scope of the Patent

(1) In the bonded resin the structure shown below is which consists of a chemical compound is the main characteristics of the electric toner used for the static charge photo finishing.

The basic structure



(In the structure X is –  Y-R3 and the portion represented by  Z3 =O= Z2 is the substituents; R1 is Ph of the alkali base; R6 is ph, alkali base, oxidized base, phenyl base, the substituents is included in the (.... Hydroxide base, halogen ion, alkali base, and other materials) phenyl base, sulfone base, and its alkali metal, alkali elements and other particles like the ammonium ion, fatty series ammonium ion, alycyclic ammonium ion, natural ammonium and other ammonium particles, Y is hydroxide, halogen ions, hydroxide base, alkali base, sulfone base, and other alkali metals, alkali elements, ammonium ion, fatty series ammonium ion, alycyclic ammonium ion, natural ammonium and other ammonium particles, z1, z2 is independent hydroxide, hydroxide base and alkali base.)

(2) In the bonded resin other coloring agents is included which is included in the scope of patent 1 and is an important article in the preparation of the Electric toner used for static charge photo finishing.

(3) On the contrary to the chemical binding shown in the figure 1 alpha 1 ~10 (wt) % is in the scope of the patent mentioned in scope of patent 1 and is also the 2nd most important point for the preparation of the Electric toner used for static charge photo finishing.

(4) In the chemical binding the main contents are vinyl benzene resin, polyester resin, silicon resin, epoxy resin and other amalgamation agents are used which are the part of the scope of the patent and it is also the most important point for the preparation of the Electric toner used for static charge photo finishing.

3. Explanatory explanation of the experiment

The invention is of the toner, and is related to the Electric toner used for static charge photo finishing.

The electrical latent image is photo finished with the use of the toner, and a photographic image is produced as the main product in this method. The photoelectric printing and the electric photographic method are distinctive in the feature. As for example the method of photoelectric printing mentioned in the English patent articles 2297,691, patent article 42-23910, patent article 43-24748 and in these patent articles various methods are mentioned for the photoelectric printing and the electric photographic method.

In the structure the photo conductor is used in various kinds of ways that are expressed, by the method of photo conductor the electrical latent image is prepared and after that the latent image is treated by the toner to obtain a figure as per the use. The dust figure is copied on a sheet of paper and then heat, pressure, flux moisture is added to the figure thus to fix the image and then the image is obtained. As there are various colors used in this process a color separation filter is used and under the photoelectric affect the above process is applied by using the yellow, magenta, cyan and other color toners are used many times to get the toner image by collecting the images together. The toner used for the photo finishing of the latent image is used further with polystyrene and other resin materials which are the coloring agents (carbon black and other coloring agents) for the decentralization ranging from 1~30 degrees of the ions. The toner is used with glass beads, iron powder, and other agents that are used as a carrier for blending the latent image to get the photo finishing.

The toner used here demands various physical and chemical properties.

But the toner generally used has various defects that are mentioned below. Most of the toners used can be affected by the atmosphere humidity thus leading to the advent of frictional electricity that has a bad affect. Most of the toners when subjected to continuation changes of the image then the toner ions and the carrier ions may collide and the ions make a contact with the photo conductor surface which leads to the bi lateral degradation of the carrier ions and the photo electric surface which may further lead to the change in the cardinal number of the shape thus the background density may increase which may further lead to the degradation of the repro quality.

Most of the toners used show these bad affect some show one of them and some have almost all of the degenerative characteristics which leads to a case where the desired improvement cannot be fulfilled.

Further the toner used for the electric photo has the characteristics mentioned above but these physical and chemical characteristics of the toner can be regulated to produce good results. For this purpose the things mentioned below are taken care of so that the defects mentioned above can be regulated and the toner that has many colors can be used to produce good results.

1) In the case of the presence of many colors on the toner the clarity of the toner is taken care of.
2) Every toner is distinguished on the basis of its compatibility.
3) In the case of the ions complying to the toner the spectra reflection is better.

In addition to this an agent cannot decide the trip potential polar characteristics so it is necessary that the color of the toner should be regulated freely to produce good results.

As for example, as known to everyone the load electric agents is mentioned in the 41012915 patent application, 43-27596 patent application, mono-azole dye and its metal complex, as mentioned in 50-133838 nitrohumic acid (salt) and other black dye agents, the use of these agents are limited. The dyes that are used for the dying (as for example magenta etc.) are used of the advent of photo finishing.

The invention as mentioned above is related to the toner.

The main idea to get the invention corrected is to bring down the frictional electricity and thus to increase the efficiency of the electric toner used for static charge photo finishing.

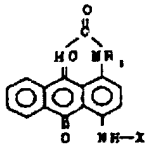
The main aim of the invention is that the toner treats the electric copy attained by the photo finishing without degrading the quality of the photo finishing by the use of electric toner used for static charge photo finishing.

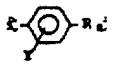
The aim of the invention is to pacify the changes in the humidity of the air that leads to the frictional electricity and thus to increase the efficiency of the electric toner used for static charge photo finishing.

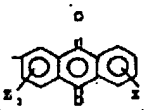
The invention is aimed towards the frictional electricity that is produced by the atmospherically changes mainly in the humidity.

The invention is aimed towards the yellow toner and the cyan toner and the toner that has more than three colors, the intensity of these toners is increased by the use of magenta toner. As mentioned above the invention consists of the basic structure shown below in the chemical bonding structure this aimed towards the Electric toner used for static charge photo finishing.

The basic structure



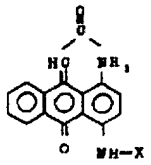


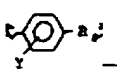
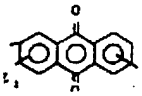


(In the structure X is . . –Y-R3 and the portion represented by . . Z3 =O= Z2 is the substituents; R1 is Ph of the alkali base; R6 is ph, alkali base, oxidized base, phenyl base, the substituents is included in the (.... Hydroxide base, halogen ion, alkali base, and other materials) phenyl base, sulfone base, and its alkali metal, alkali elements and other particles like the ammonium ion, fatty series ammonium ion, alycyclic ammonium ion, natural ammonium and other ammonium particles, Y is hydroxide, halogen ions, hydroxide base, alkali base, sulfone base, and other alkali metals, alkali elements, ammonium ion, fatty series ammonium ion, alycyclic ammonium ion, natural ammonium and other ammonium particles, z1, z2 is independent hydroxide, hydroxide base and alkali base.)

Mentioned below is the basic structure of the Electric toner used for static charge photo finishing.

The toner-bounded resin is mentioned in the public announcement and can be used in various kinds such as poly vinyl benzene, chloro poly vinyl benzene, poly-omega-methyl vinyl benzene, vinyl benzene chloro vinyl benzene co polymerized compound, vinyl benzene propylene co polymerized compound, vinyl benzene butadiene co polymerized compound, vinyl benzene salt vinyl co polymerized compound, vinyl benzene oxidized vinyl co polymerized compound, vinyl benzene - mallein oxidized co polymerized compound, vinyl benzene acrylic oxide ether co polymerized compound (vinyl benzene acrylic oxide methyl co polymerized compound, vinyl benzene acrylic oxide ether co polymerized compound, vinyl benzene acrylic oxide methyl co polymerized compound, vinyl benzene acrylic butyl co polymerization compound, vinyl benzene acrylic phenyl co polymerization compound), vinyl benzene methacrylic oxide ether co polymer compound, (vinyl benzene methacrylic oxide methyl co polymer compound, vinyl benzene methacrylic oxide ethyl co polymer compound, vinyl benzene methacrylic oxide butyl co polymer compound, vinyl benzene methacrylic oxide phenyl co polymer compound), vinyl benzene – alpha – chloro alkyl oxide methyl co polymer compound, vinyl benzene chloro nitryl alkyl oxide ether co polymer compound, and other vinyl benzene compounds (vinyl benzene and vinyl benzene substituents and other compounds with the same polymer or other co polymers), salinated vinyl resin, ethylene oxide vinyl co polymer compound, rosin changes mallein oxide resin, phenyl resin, epoxy resin, polyester resin, low molecular weight polythene, low molecular weight poly propylene, ionomer resin, poly ethyl carbamate resin, silicon resin, ketone resin, ethylene ethyl acrylates, xylane resin, poly vinyl butyl resin and other resins, during the time of actual experiment the main resin which is used is the vinyl benzene resins, polyester resin, silicon resin and epoxy resin. Further the resins mentioned above are also used and mainly two of the resins are used in the actual experiment.
In the actual experiment the structure of the compound is as mentioned below.



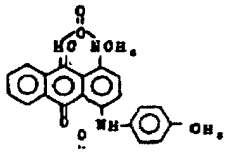
(In the structure X is  –Y-R3 and the portion represented by  Z3 =O= Z2 is the substituents; R1 is Ph of the alkali base; R6 is ph, alkali base, oxidized base, phenyl base, the substituents is included in the (.... Hydroxide base, halogen ion, alkali base, and other materials) phenyl base, sulfone base, and its alkali metal, alkali elements and other particles like the ammonium ion, fatty series ammonium ion, alycyclic ammonium ion, natural ammonium and other ammonium particles, Y is hydroxide, halogen ions, hydroxide base, alkali base, sulfone base, and other alkali metals, alkali elements,

ammonium ion, fatty series ammonium ion, alycyclic ammonium ion, natural ammonium and other ammonium particles, z1, z2 is independent hydroxide, hydroxide base and alkali base.)

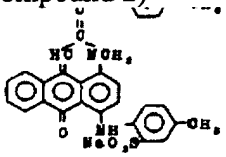
The compound or the polymer used in the experiment is bounded resin. The coloring agent is prepared independently and is used as mentioned below and many compounds are combined to make the color toner, this explains the making of the magenta toner.

The compounds used in the actual experiment in mainly made as shown in the following structure.

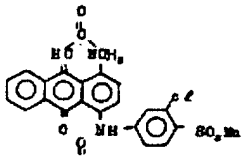
(Compound 1)



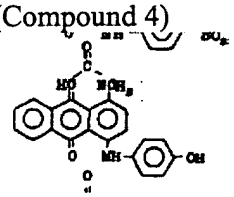
(Compound 2)



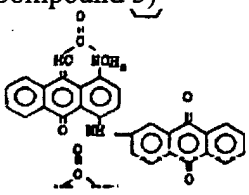
(Compound 3)



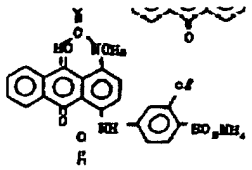
(Compound 4)



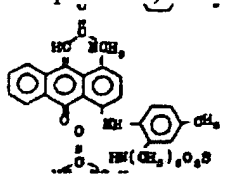
(Compound 5)



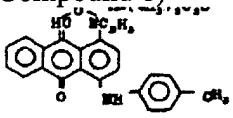
(Compound 6)



(Compound 7)

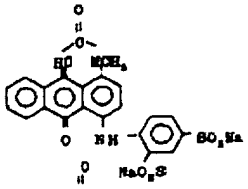


(Compound 8)



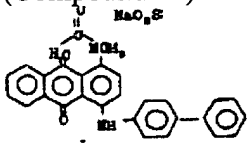
（化合物例８）

(Compound 9)



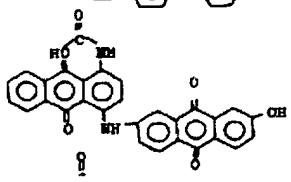
（化合物例９）

(Compound 10)



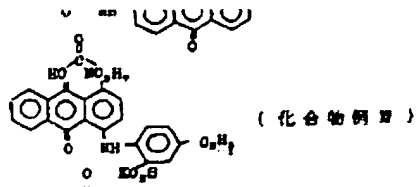
（化合物例１０）

(Compound 11)

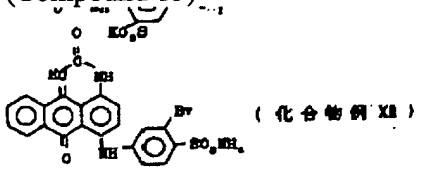


（化合物例１１）

(Compound 12)



(Compound 13)



In the actual experiment the use of compounds is not limited to the compounds mentioned above, other compounds or use of more than one compound is also possible.
In the actual experiment the coloring agents are added to the compounds mentioned above. The coloring agents added to the compounds mentioned above complies to the patent application. As for example carbon black, nigrosin, as mentioned in the patent application 43-27596 the metal powder such as mono azole, black metal, flexo red, brilliant carmine 6 B, quinacridone, 2,9 di methyl quinacridone, xanthein and other dying agents and their mordant are also used.
As mentioned above in the example, (shown in the basic structure) the use of the compounds is not limited to the compounds mentioned above. The bounded resin is used with different kinds of coloring agents and the amount of the coloring agents to be used is limited. The amount of resin used is limited between a range of 0.1 ~ 10 (weight) %.
In the case of the wt % being less than 0.1 the result of the experiment is degraded an in the case of wt % being more than 10 there is a degradation in the result of the experiment.
Mentioned below is the actual experiment in detailed manner. For the understanding of the actual experiment the experiment can be compared to the one mentioned below.

Experiment 1

Polythene resin 100 (weight) part, carbon black 6 (weight) part are mixed together and used and the compounds 2 (weight) part, is mixed and grinded with the ball mill, dissolved in the roll mill, and after freezing the product in the hammer mill it is once again grinded, after that the product is subjected to the air jet which leads to the further grinding of the product. The grinded product thus obtained is then classified into 3 to 20 myuu and then they are treated in the toner. In the toner 10 weight part is the product (name of the product EFV 200/300 Japan metal powder company) and 90 weight parts is the carrier metal powder. During the photo finishing the trip is not limited and can be –6.0 myuu C/G. In the case of trip being maintained during the process it is done through the blow off method. (This is mentioned in the electric photo association patent application 1975.3.) The actual experiment mentioned blow can be compared and this can control the trip weight.

With the use of the developing agent the drying common paper electric photo developing (name of the product NP 1200, canon K.K. product) the photo developing is done and in this case the clear black image is obtained. Further in the case of obtaining more than 3 million sheets the quality of the sheet gets degraded. The high temperature and high humidity also affect this toner during a period of one year and the quality of the product may get degraded.

Experiment 2

The composition of the toner

Vinyl benzene alkali methyl oxide co polymer 80 (wt) part

Vinyl benzene mallein oxide co polymer 20 (wt) part

Carbon black 10 (wt) part

The actual compound mentioned in Experiment 1 4 (wt) part

is mixed together as mentioned in the Experiment 1 and is classified to obtain a clear black image.

In this case the toner trip is load wt is –6.5 myuu C/G.

Experiment 3 to 10

The composition of toner is maintained as mentioned below. The other features are similar to the actual experiment 1.

Actual experiment number	Toner composition (wt) part	Trip load wt (myuu C/G)
3	Vinyl benzene butadiene co polymer ------ 100 Carbon black ----- 10 The actual compound mentioned in experiment 4 ------- 3	-5.4
4	Vinyl benzene methacrylic acid oxide co polymer ------ 90 Poly vinyl butyl ----- 10 Carbon black ------ 8 The actual compound mentioned in experiment 5 ------- 3	-5.1
5	Epoxy resin ----- 70 Silicon resin ------ 30 Carbon black ------ 6 The actual compound mentioned in experiment 6 ------- 2	-5.0
6	Poly ether resin ------ 80	-7.6

	Silicon resin ------ 20 Carbon black ----- 10 The actual compound mentioned in experiment 3 ------- 4	
7	Phenol resin ---- 50 Poly ether ----- 50 Carbon black ---- 4 The actual compound mentioned in experiment 3 ------- 0.5	-5.0
8	Poly vinyl benzene resin ----50 Poly vinyl benzene resin ---50 Nigrosin ----5 The actual compound mentioned in experiment 1 ------- 4	-4.0
9	Vinyl benzene mallein oxide co polymer -------- 90 Silicon resin -------- 10 Carbon black ------ 6 The actual compound mentioned in experiment 10 ------- 3	-5.9
10	Poly ether resin ---- 80 Rosin changed mallein oxide polymer ------- 20 Carbon black --- 3 Nigrosin ------ 3 The actual compound mentioned in experiment 3 ------ 5	-4.1

Experiment 11

The composition of the toner

Poly vinyl benzene resin --------100 (wt) part

Brilliant carmine 6 B ----------5 (wt) part
The actual compound mentioned in experiment 1--------2 (wt) part

is mixed together as mentioned in the Experiment 1 and is classified to obtain a clear magenta image.
In this case the toner trip is load wt is –6.5 myuu C/G.
With the use of this product for more than 2 million images the quality of the product is degraded. Further benzidine yellow is also included to the yellow toner, phthalocyanine blue is added to the cyan toner, and the magenta toner mentioned above formed by three toners is used to do the experiment thus to obtain a perfect black image.

Experiment 12 ~

The composition of the toner is similar to the toner composition mentioned above till experiment 11 but the items mentioned below are further added. In this case the clear magenta toner is obtained. The trip of the toner is also limited.

Actual experiment number	Toner composition (wt) part	Trip load wt (myuu C/G)
12	Poly vinyl benzene resin ------ 100 2,9- di methyl quinacridone --- 3 The actual compound mentioned in experiment 2 ------ 1	-5.8
13	Poly vinyl benzene resin ------ 100 The actual compound mentioned in experiment 1 ------ 6	-12.0
14	Poly vinyl benzene butadiene co polymer ------ 80 Poly vinyl benzene resin ----- 20 The actual compound mentioned in experiment 2 ------ 5	-10.2
15	Poly ether resin ----- 70 Silicon resin ----- 30 Rhodamine B ----- 3 The actual compound mentioned in experiment 2 ------ 3	-6.5
16	Poly vinyl benzene methacrylic oxide butyl ----- 50 Poly vinyl benzene resin ----- 50 Brilliant carmine 6 B ------- 4 The actual compound mentioned in experiment 1 ------ 2	-7.3
17	Epoxy resin ------ 30 Silicon ------ 70 The actual compound mentioned in experiment 5 ------ 10	-6.5

Comparison 1

The composition of the toner
Poly vinyl benzene ------- 100 (wt) part

Carbon black ------ 6 (wt) part

Is compared to the actual experiment 1 and the detailed classification is done after the clear image is obtained. The toner trip is maintained at –0.3 myuu C/G.

Comparison 2

The composition of the toner

Poly vinyl benzene ------- 100 (wt) part

Brilliant carmine 6 B ----- 5 (wt) part
Is compared to the actual experiment 1 and the detailed classification is done after the clear image is obtained. The toner trip is maintained at –2.1 myuu C/G.